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(54) **Television receiver with additional display of characters**

Fernsehempfänger mit zusätzlicher Wiedergabe von Zeichen

Récepteur de télévision avec reproduction additionnelle de caractères

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(73) Proprietor: **FERGUSON LIMITED**
Enfield, Middlesex, EN1 1ND (GB)

(72) Inventor: **Flowers, Howard Peter**
Enfield, Middlesex EN1 4LT (GB)

(74) Representative: **Einsel, Robert, Dipl.-Ing.**
Deutsche Thomson-Brandt GmbH
Patent- und Lizenzabteilung
Göttinger Chaussee 76
30453 Hannover (DE)

(56) References cited:
GB-A- 2 110 049 **US-A- 4 388 639**

- **PATENT ABSTRACTS OF JAPAN vol. 7, no. 170 (E-189)(1315) 27 July 1983 & JP-A-58 075 989**

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Description

The invention relates to a television receiver with additional display of characters within a box wherein the normal picture is displayed also within said box.

According to prior art a television receiver displaying a normal picture on the screen of the picture tube includes means for additionally displaying characters on a part of the screen within the normal picture. Said characters may include an explanation of the normal picture just displayed. They may include any news or special hints for the controlling or tuning or adjusting of the receiver.

The characters in form of symbols, letters or numbers may be merely inserted into the picture so that only the characters themselves occupy a part of the picture area. In other cases a so-called box is provided within the picture area and the characters appear within said box. The box forming a background for the characters may be displayed in black or any other colour.

If the characters are located within a box having a background with uniform colour a good visibility of the characters is achieved as the characters within the box are not surrounded by the normal picture. On the other hand a part of the normal picture is lost and cannot be regarded. This is a disadvantage especially in cases where the box occupies a relative large area of the picture.

Another solution consists of displaying the normal picture also within the box. In this case the normal picture can be seen within the area occupied by the box except the small areas of the characters. However, in this case it becomes difficult to read the characters as they are surrounded by the normal picture. Said two demands for display of nearly the full picture also in the box on the one hand and a good visibility of the characters on the other hand therefore seem to be contrary and not possible simultaneously.

It is an object of the invention to modify the receiver in such a way that said two requirements for display of the full picture and good visibility of the characters are achieved simultaneously.

According to the invention, a television receiver as specified in appended claim 1 is provided.

According to the invention, the amplification of the picture signal fed to the picture tube is reduced during display of the box above a predetermined threshold.

It was found that at reduced brightness the picture within the box is still discernible. On the other hand the reduced brightness within the box permits a good visibility of the characters which is not disturbed by the picture forming the background within the box.

Said means for handling the signal may be arranged within the path of the RGB-signals, within the path of the composite video signal (CVBS) or within the path of the luminance signal and/or within the path of the demodulated colour difference signals or color component signals. The solution used depends upon the circuitry used in the television receiver.

Preferably the means for reducing the brightness are adjustable in order to adapt said reduction to the special requirements or individual impressions of the viewer.

In order that the invention may bore more readily be understood, a description is now given by way of example only, reference being made to the accompanying drawing. Within the drawing

Fig. 1 shows the screen together with the box and the characters,
Fig. 2 shows a circuit diagram of the invention and
Figures 3 and 4 show prior art circuit characteristics, and
Fig. 5 shows a characteristic of the circuit shown in Fig. 2.

Fig. 1 shows a picture screen 1 on which a normal picture 2 is displayed. Within the picture 2 a box 3 of rectangular form is displayed. Within the box 3 characters 4 are displayed including additional information for the viewer. The normal picture 2 is also displayed within the area of box 3 except the small areas of the characters 4. The picture 2 outside the box 3 as well as the characters 4 are not modified compared with prior art. However, the brightness of the normal picture 2 within the box 3 is reduced with respect to the brightness of the picture 2 outside the box thereby reducing the contrast within the box compared to the remaining picture. Therefore, the picture 2 can also be regarded within the area of box 3 whereas the readibility of the characters 4 is not decreased.

Fig. 2 shows the circuit for producing a signal for a display according to Fig. 1. During normal picture 2 outside the box 3 the video signal is fed from terminal 5 via lead 6, switch S1 in the shown position and switch S2 in the shown position to output terminal 7. During this interval the video signal is not modified by the circuit shown.

Within box 3, that means during several lines or during special parts of several lines the switch S1 is switched to the lower position by pulse 10. Now the video signal from terminal 5 is fed via circuit 11 which reduces the contrast of said signal. Instead of original video signal at terminal 5 now the signal Vo with reduced contrast is fed via S1 and S2 in the lower position to terminal 7 for display on the screen of the tube.

During the characters 4 within box 3 switch S2 is switched by pulse 12 to the upper position. Now the video signal from terminal 5 is completely switched off and replaced by the text signal from terminal 13 representing characters 4.

Figures 3 and 4 show known solutions to the problem of clearly displaying characters, disclosed in JP-A-58 075 989 and Patent Abstracts of Japan, Vol. 7, No. 170, (E-189) [1315].

Figure 5 shows the characteristic of circuit 11 in ac-

cordance with the present invention.

According to Fig. 3 the signal path represented by lead 6 normally has an amplification according to curve 13. The circuit 11, however, has an amplification according to curve 14, so that the amplitude of the signal Vo compared with the signal Vi is reduced for reducing the brightness within box 3.

In Fig. 4 the amplification of the signal is not changed below a threshold value Vos. Above Vos however the signal Vi is amplitude limited or clipped so that the amplitude of Vo used for display during box 3 is limited at a value Vos.

Fig. 5 shows the combination of the solutions according to Fig. 3,4. Up to Vos amplification is unchanged whereas above Vos the signal is not amplitude limited but provided with a lower amplification factor represented by the different lines shown.

The modification of signal Vi within circuit 11 may be adjustable to different values of amplification or to different threshold values shown in Fig. 4,5 as illustrated by the symbols within circuit 11. Circuit 11 can be implemented by analogue or digital means or a combination of analogue and digital means. This adjustment can be made by a remote control unit, or be preset or be fixed.

These conditions can be set up by physical components or by digital means.

Digital means can include read only memory, non-volatile memory or read-write memory.

The storage associated with digital means may be external to circuit 11.

Claims

1. Television receiver with additional display of characters within a box on the screen wherein the normal picture is displayed also within said box, **characterized by** means for reducing the brightness of the picture within the box in relation to the brightness outside the box exept for the characters by reducing to a value above zero the amplification applied to the picture signal only above a predetermined threshold signal value, said amplification being higher than if the picture signal were clipped above said predetermined threshold.

2. Receiver according to claim 1, **characterized in that** said means are arranged within the paths of the RGB signals.

3. Receiver according to claim 1, **characterized in that** said means are arranged within the path of the composite video signal.

4. Receiver according to claim 1, **characterized in that** said means are arranged within the path of the luminance signal.

5. Receiver according to claim 1, **characterized in that** said means are arranged within the path of the demodulated colour difference signals.

6. Receiver according to clam 1, **characterized in that** said means are arranged within the path of the demodulated colour component signals.

7. Receiver according to any one of preceding claims, **characterized in that** said means are adjustable for varying the brightness of the picture within the box.

Patentansprüche

1. Fernsehempfänger mit zusätzlicher Anzeige von Zeichen innerhalb eines Kastens auf dem Schirm, wobei das normale Bild auch innerhalb des Kastens angezeigt wird, gekennzeichnet durch Mittel zur Verminderung der Helligkeit des Bildes innerhalb des Kastens in bezug auf die Helligkeit außerhalb des Kastens mit Ausnahme für die Zeichen, indem die Verstärkung, der das Bildsignal unterworfen wird, nur oberhalb eines vorgegebenen Schwellen-Signalswertes auf einen Wert oberhalb von Null verringert wird, wobei die Verstärkung höher ist als wenn das Bildsignal oberhalb der vorgegebenen Schwelle abgeschnitten würde.

2. Empfänger nach Anspruch 1, dadurch gekennzeichnet, daß die Mittel innerhalb der Wege der RGB-Signale angeordnet sind.

3. Empfänger nach Anspruch 1, dadurch gekennzeichnet, daß die Mittel innerhalb des Weges des zusammengesetzten Videosignals angeordnet sind.

4. Empfänger nach Anspruch 1, dadurch gekennzeichnet, daß die Mittel innerhalb des Weges des Luminanzsignals angeordnet sind.

5. Empfänger nach Anspruch 1, dadurch gekennzeichnet, daß die Mittel innerhalb des Weges der demodulierten Farbdifferenzsignale angeordnet sind.

6. Empfänger nach Anspruch 1, dadurch gekennzeichnet, daß die Mittel innerhalb des Weges der demodulierten Farbkomponentensignale angeordnet sind.

7. Empfänger nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Mittel einstellbar sind, um die Helligkeit des Bildes innerhalb des Kastens zu ändern.

Revendications

1. Récepteur de télévision avec reproduction additionnelle de caractères au sein d'une case de l'écran dans lequel l'image normale est également reproduite à l'intérieur de ladite case, caractérisé par des moyens de réduction de la luminosité de l'image à l'intérieur de la case par rapport à la luminosité à l'extérieur de la case, à l'exception des caractères, en réduisant à une valeur supérieure à zéro l'amplification appliquée au signal d'image seulement au-dessus d'une valeur de seuil prédéterminée du signal, ladite amplification étant supérieure à celle appliquée si le signal était coupé au-dessus dudit seuil prédéterminé.

2. Récepteur selon la revendication 1, caractérisé par le fait que lesdits moyens sont installés dans les chemins des signaux RVB.

3. Récepteur selon la revendication 1, caractérisé par le fait que lesdits moyens sont installés dans le chemin du signal vidéo composite.

4. Récepteur selon la revendication 1, caractérisé par le fait que lesdits moyens sont installés dans le chemin du signal de luminance.

5. Récepteur selon la revendication 1, caractérisé par le fait que lesdits moyens sont installés dans le chemin des signaux démodulés de différence de couleur.

6. Récepteur selon la revendication 1, caractérisé par le fait que lesdits moyens sont installés dans le chemin des signaux de chrominance.

7. Récepteur selon l'une quelconque des revendications précédentes, caractérisé par le fait que lesdits moyens sont réglables afin de faire varier la luminosité de l'image à l'intérieur de la case.

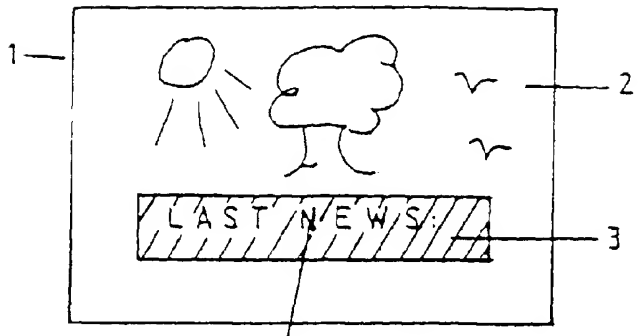

Fig.1

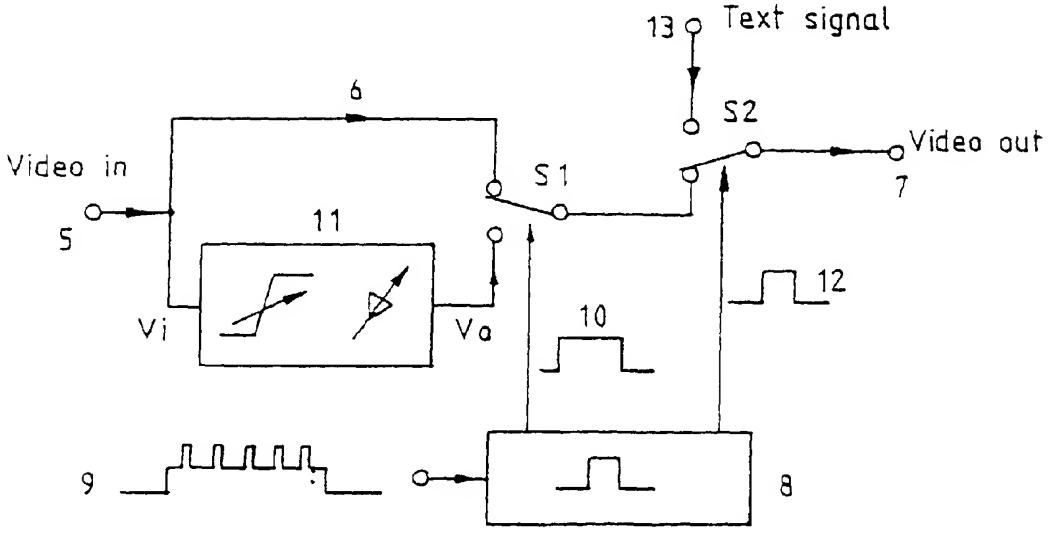

Fig.2

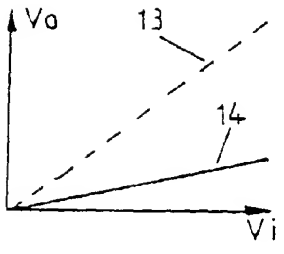

Fig. 3

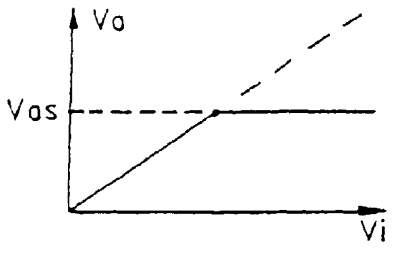

Fig.4

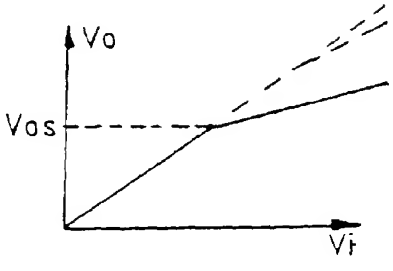

Fig. 5